

Claims

- [c1] 1. An organic electroluminescent device having solar cells, comprising:
a transparent substrate having an electroluminescent area and an exposure area;
an organic electroluminescent device disposed within the electroluminescent area of the transparent substrate;
at least one solar cell disposed within the exposure area of the transparent substrate;
a driving unit coupled to the organic electroluminescent device;
a transform unit coupled to the solar cell; and
a control unit coupled to the driving unit and the transform unit.
- [c2] 2. The organic electroluminescent device having solar cells of claim 1, wherein the organic electroluminescent device comprises, in sequence, a transparent anode, an organic electroluminescent layer and a metal cathode.
- [c3] 3. The organic electroluminescent device having solar cells of claim 2, wherein the transparent anode comprises indium–tin oxide or indium–zinc oxide.

- [c4] 4. The organic electroluminescent device having solar cells of claim 2, wherein the organic electroluminescent layer comprises a hole injection layer, a hole transporting layer, a light-emitting layer, an electron transporting layer and an electron injection layer.
- [c5] 5. The organic electroluminescent device having solar cells of claim 2, wherein the organic electroluminescent layer is a small molecular organic electroluminescent material or a polymer electroluminescent material.
- [c6] 6. The organic electroluminescent device having solar cells of claim 2, wherein the metal cathode comprises aluminum, aluminum/lithium fluoride, calcium, magnesium/silver alloy or silver.
- [c7] 7. The organic electroluminescent device having solar cells of claim 1, wherein the solar cell comprises, in sequence, a transparent cathode, an electroluminescent layer and a metal anode.
- [c8] 8. The organic electroluminescent device having solar cells of claim 7, wherein the transparent cathode comprises indium-tin oxide or indium-zinc oxide.
- [c9] 9. The organic electroluminescent device having solar cells of claim 7, wherein the electroluminescent layer comprises an organic material or an inorganic material.

- [c10] 10. The organic electroluminescent device having solar cells of claim 7, wherein the metal anode comprises aluminum, aluminum/lithium fluoride, calcium, magnesium/silver alloy or silver.
- [c11] 11. A method of fabricating an organic electroluminescent device having solar cells, comprising:
providing a transparent substrate having an electroluminescent area and an exposure area;
forming an organic electroluminescent device within the electroluminescent area of the transparent substrate and at least one solar cell within the exposure area of the transparent substrate;
coupling the organic electroluminescent device to a driving unit;
coupling the solar cell to a transform unit; and
coupling the driving unit and the transform unit to a control unit.
- [c12] 12. The method of fabricating an organic electroluminescent device having solar cells of claim 11, wherein the method of forming the organic electroluminescent device and the solar cell on the transparent substrate comprises:
forming a patterned transparent anode and a patterned transparent cathode on the transparent substrate;

forming an organic electroluminescent layer on the transparent anode and an electroluminescent layer on the transparent cathode; and
forming a metal cathode on the organic electroluminescent layer and a metal anode on the electroluminescent layer.

[c13] 13. The method of fabricating an organic electroluminescent device having solar cells of claim 12, wherein the transparent anode comprises indium-tin oxide or indium-zinc oxide.

[c14] 14. The method of fabricating an organic electroluminescent device having solar cells of claim 12, wherein the transparent cathode comprises indium-tin oxide or indium-zinc oxide.

[c15] 15. The method of fabricating an organic electroluminescent device having solar cells of claim 12, wherein the electroluminescent layer comprises an organic material or an inorganic material.

[c16] 16. The method of fabricating an organic electroluminescent device having solar cells of claim 12, the method of forming the organic electroluminescent layer comprises:
forming a hole injection layer on the transparent anode;

forming a hole transporting layer on the hole injection layer;
forming a light-emitting layer on the hole transporting layer;
forming an electron transporting layer on the light-emitting layer; and
forming an electron injection layer on the electron transporting layer.

[c17] 17. The method of fabricating an organic electroluminescent device having solar cells of claim 12, wherein the electroluminescent layer comprises an organic electroluminescent material or an inorganic electroluminescent material.

[c18] 18. The method of fabricating an organic electroluminescent device having solar cells of claim 12, wherein the metal cathode comprises aluminum, aluminum/lithium fluoride, calcium, magnesium/silver alloy or silver.

[c19] 19. The method of fabricating an organic electroluminescent device having solar cells of claim 12, wherein the metal anode comprises aluminum, aluminum/lithium fluoride, calcium, magnesium/silver alloy or silver.